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SAFETY PROGRESS IN ANTHRACITE AND BITUMINOUS COAL FIELDS

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DEPARTMENT OF COMMERCE - BUREAU OF MINES

SAFETY PROGRESS IN ANTHRACITE AND BITUMINOUS-COAL FIELDS[1]

By D. Harrington[2]

The mining industry of the United States has for many years possessed the dubious distinction of having the poorest accident rate of all of the major lines of industrial endeavor in this country, and until recently there was little or nothing to show that any material improvement might be expected. However, there are now numerous trends indicating that the corner has been turned at last, and it is strongly hoped that the mining industry is likely to follow the railroads, the cement and other industries in operating with occurrence of only a reasonable amount of loss of life and limb through accidents.

The complete accident figures for metal and nonmetallic mineral mining for 1931 are not yet available, but fragmentary data show that 1931 will unquestionably have very low accident rates, probably the lowest in the history of our metal mines. One underground metal mine has produced over 14,000,000 tons of copper ore without a fatality; another metal mining company with an electric shovel operation has handled upwards of 75,000,000 tons of material, copper ore and waste, without the occurrence of a fatality; an iron-ore company which owns six mines (three underground, three open pit), has operated every one for a year or more without a lost-time accident with a considerable number of employees and a large production; and another iron-ore producer with 30 mines and about 3,000 employees has an average of nearly 10 months of operation in 1931 without a lost-time accident. Numerous other wonderful safety records of metal mines in 1931 indicate unmistakably that the record of the noncoal mining industry of the United States as a whole in 1931 will undoubtedly be found to be excellent.

According to the latest relatively complete figures (those of 1930) available for the coal industry, fewer than 650,000 persons are employed in and around the coal mines of the United States, the figures indicating that a little over 493,000 people are engaged in bituminous mining and a little under 151,000 in anthracite mining. Bureau of Mines complete figures show that 2,063 persons were killed and 103,821 non-fatally injured in our coal mines in 1930; in addition to the 2,063 killed, 122 suffered permanent total disability injuries. The figure of 2,063 killed in 1930 was a substantial reduction from the average of 2,409 killed annually in our coal mines for the past 25 years. Inasmuch as 1930 is the first year in which nationwide figures on nonfatal accidents in coal mining have been collected, it is not possible to give comparative nonfatal accident figures for 1930 as against the average for the past 25 years. The fatal accident rate per million tons of coal mined in 1930 was 3.84, or much lower than the 4.45 average rate for the past 25 years.[3]

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[1] The Bureau of Mines will welcome reprinting of this paper, provided the following footnote acknowledgment is used: "Reprinted from U. S. Bureau of Mines Information Circular 6671."

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Although the fatality rate of 3.84 per million tons produced in 1930 is much better than the 4.45 average rate for the past 25 years, it was not so good as the 3.75 rate per million tons mined for the 5-year period 1926-1930, inclusive, and was but little better than the 3.95 rate for the 5-year period 1921-1925, or the 3.86 rate for the period 1916-1920; hence, but little improvement can be claimed in the fatality record of coal mining up to and including 1930. It remained for 1931 with its numerous and varied vicissitudes (among them the fact that the tonnage of about 438,000,000 was the lowest since 1908) to show the way to real progress in coal-mine safety; the tentative coal-mining fatality rate of 3.27 persons killed per million tons mined in 1931 sets a record not equaled or surpassed in any year in the present century, and probably not equaled in any year in the history of coal mining in the United States. With but about 1,430 persons killed in the coal mines of the United States in 1931 as against 2,063 in 1930 and against an average of 2,409 for the past 25 years, it is seen that in 1931 our coal mines had 633 fewer fatalities than in 1930 and had 979 fewer than the 25-year average annual rate. The previous record of the century for small number of coal-mine fatalities in one year in the United States was that of 1922 when 1,984 were killed; hence, 1931 beats the 1922 record by 554 fewer fatalities, and while 1922 produced nearly 477,000,000 tons of coal against but about 438,000,000 tons in 1931, the fatality rate per million tons mined in 1931 was 3.27, or much lower than the 4.16 rate in 1922. The exact 1931 figures will not be available for some months yet, but it seems perfectly safe now to predict that not only the coal-mine fatality rate per million tons mined, but also the fatality rate per thousand 300-day workers, or per thousand employed or per million man-hours worked, will be lower than in any other year in the history of modern coal mining in the United States.

Alaska, Michigan, and Texas had no fatalities in coal mines in 1931, while every other coal-producing State except Indiana, Montana, North Dakota, and Maryland reported fewer fatal accidents in 1931 than in 1930. Alabama's coal mines had an especially good record with but 25 fatalities in 1931 as against 63 in 1930, 72 in 1929, 67 in 1928, 93 in 1927, 139 in 1926, and 161 in 1925. Other States in addition to Alabama which reduced coal-mine fatalities in 1931 by 50 or more per cent as compared with 1930 are New Mexico, Ohio, Oklahoma, Utah, and Washington. In general, much of the improvement in these States has been due to the fact that they had no explosions in 1931, though they had one or more explosions in 1930.

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[3] The rate per million tons mined is by no means a fair standard or even an accurate means of comparing accidents, but unfortunately it is of comparatively widespread use in connection with coal-mining accidents in the United States, and will be used largely in this paper.

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One of the reasons for the excellent safety record in coal mining in 1931 was the fact that explosions caused only 86 fatalities as compared with 264 in 1930 and an average of 341 annually from 1922 to 1931, inclusive. From January 28, 1931, to November 3, 1931, or over nine months, the bituminous mines of the United States did not have a major explosion disaster, this unquestionably being the longest consecutive period of immunity from major explosion disasters in the bituminous coal mines of the United States in at least 50 years. While numerous factors contributed to this nine months' avoidance of major explosions in bituminous mines (there was one major explosion in an anthracite mine), undoubtedly during this period rock-dusting prevented at least three major disasters with the possible, even probable, death of 300 or more persons.

The 1931 coal-mining fatality record is the more remarkable because of having been established in a year of acute financial depression. During the past 25 years there have been at least four financial depressions of a major nature: That of 1907-1908, the war depression panic of 1914-1915, the primary post-war panic of 1920-1922, and the present or secondary post-war panic of 1930-1932. Naturally, coal production fell off in each case; in 1908 the tonnage was 409,000,000 as against an average of 451,000,000 for the 5-year period 1906-1910, inclusive; tonnage was 513,000,000 in 1914, compared with 570,000,000 in the previous year and 529,000,000 as the average for the five years 1911-1915, inclusive; tonnage was 477,000,000 in 1922 against an average of 559,000,000 for the 5-year period 1921-1925, inclusive; and in 1931 it was about 438,000,000 against an average of 595,000,000 tons for the 5-year period 1926-1930, inclusive. In all of these panic years except that of 1931, the fatality rate per million tons of production was higher than the average of the 5-year period in which it occurred; 1931, on the other hand, with about 1,430 fatalities (according to present available data) and with approximately 438,000,000 tons produced has a fatality rate per million tons of production of but about 3.27, as against 3.75 for the 5-year period 1926-1930, inclusive. Hence, it will be seen that the excellent rate established in the panic or depression year 1931 does not follow the precedent of having a high accident rate, as has happened in other panic years of the present century.

Bituminous mining in 1931, with a fatality rate of about 2.78 per million tons of coal produced, shattered all known safety records, and for the first time in at least 40 years the rate was below 3.00 killed per million tons produced. Anthracite mining, on the other hand, had a fatality rate in 1931 which sadly handicapped the record of the coal industry as a whole; the fatality rate of 6.38 killed per million tons produced in anthracite mining in 1931 was materially higher than the 6.04 average rate of that industry for the 5-year period 1926-1930, inclusive, or the 5.80 average rate for the 5-year period 1921-1925, inclusive, or the 6.07 average rate for the 5-year period 1916-1920, inclusive. In other words, the excellent accident record of the coal-mining industry in 1931 was due entirely to the fine safety work done in bituminous mining; the anthracite industry was a hindrance rather than a help, with its heavy accident occurrence and rate. The anthracite mining fatality rate per million tons produced was materially higher in 1931 than the average rate of that industry for the past 15 years; in fact, there were but four years out of the last 15 with a higher anthracite mining fatality rate than that of 1931.

The bituminous mines of Pennsylvania made an excellent record in 1931 with but 209 fatalities with a fatality rate of 2.00, as against 380 fatalities and rate of 6.38 in the anthracite mines. The 1931 fatality rate of about 2.00 per million tons produced by the bituminous mines of Pennsylvania was by far the lowest or best rate for those mines since 1883, when the rate was 2.01; the 1931 rate of 2.00 was much better than the 2.88 average for the 5-year period 1926-1930, or the 2.67 average of the 5-year period 1921-1925, or the 2.66 average of the 5-year period 1916-1920. The 209 fatalities in the bituminous mines of Pennsylvania in 1931 are less than half of the average of 420 fatalities annually in those mines for the previous 20 years. Unquestionably one of the outstanding factors in the reduction of fatal accidents in the bituminous mines of Pennsylvania in 1931 was the avoidance of major explosion disasters. No major explosion (one in which five or more lives were lost) occurred in a bituminous coal mine in Pennsylvania in 1931; there has been no major coal mine explosion disaster in a Pennsylvania bituminous mine since March 21, 1929, or for more than three years -- a record which points the way for the entire coal-mining industry of the United States; in fact, the coal mining industry as a whole may be proud of this exceptionally fine accomplishment, even though it is due entirely to the efforts of those engaged in one manner or other in work in the bituminous mines of Pennsylvania. In addition to avoiding major disasters and having probably an all-time low fatality rate, the bituminous mines of Pennsylvania showed numerous other safety accomplishments in 1931 - not a person was fatally burned by a gas ignition; 18 out of 56 awards of the J. A. Holmes Safety Association for safety performances of the mineral industries throughout the United States for 1931 were given to persons or organizations in bituminous mining in Pennsylvania; 30 new chapters of the Holmes Safety Association were organized and more than 20,000 bituminous miners of Pennsylvania are now members of that organization; in 1931 over 24,000 persons engaged in bituminous mining in Pennsylvania took the full Bureau of Mines course in first-aid or mine rescue work, and 33 mining organizations with 43 mines received 100 per cent certificates for having the entire personnel so trained.

An analysis of carefully kept accident data reveals many facts. For instance, Bureau of Mines statistics show that in the 5-year period 1925-1929, inclusive, the total number of fatalities from explosives in Pennsylvania anthracite mining averaged 48 per year for its approximately 160,000 employees; all of the bituminous mines of the United States, with approximately 525,000 employed, averaged but 46 deaths from explosives; and Pennsylvania's bituminous mines, with about 145,000 employed, averaged but 8 such fatalities yearly. This indicates strongly that there is something defective in blasting practice in anthracite mining, and that concerted action should be taken to remedy a condition that is certainly unsafe. That there are relatively safe methods of coal-mine blasting can be substantiated by the fact that an electric

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blasting system with firing of all shots from the surface with all persons out of the mines, has been in use for over 40 years in certain Utah and Colorado coal mines which have produced at least 75,000,000 tons of coal without a fatality from blasting.

In the 5-year period 1925-1929, during which about 160,000 were employed in anthracite mines, an average of 52 persons were killed annually in those mines by falls of face or pillar coal; whereas in the bituminous mines of the United States, in which about 625,000 were employed, only about 88 were killed annually from the same cause; and but 30 were killed by such falls in the bituminous mines of Pennsylvania out of about 145,000 employed; these figures indicate almost a 50 per cent excessive death rate from falls of face or pillar coal in anthracite mines. During 1925-1929, inclusive, falls of roof (coal, roof, etc.) annually killed about 172 persons in anthracite mines and about 175 in Pennsylvania bituminous mines, as against 825 in the bituminous mines of the United States, indicating a more favorable rate from this cause in anthracite than in bituminous mines and even a slightly better rate than the bituminous mines of Pennsylvania in proportion to men employed; however, on the basis of exposure (number of fatalities per million man-hours of exposure) the bituminous mines of Pennsylvania as compared with anthracite mines had a more favorable rate from falls of roof and coal by about 10 per cent. It would appear that much additional precaution should be taken to the curbing of accidents from falling material, but especially from falling face or pillar coal in both anthracite and bituminous mines.

The record for the 1925-1929 period shows that annually an average of six persons met death in anthracite mines from suffocation by mine gases and that but five persons met death from this cause in bituminous mines, which employ about four times as many men as anthracite mines. The number is excessive not only in anthracite but also in bituminous mines, and is indicative of poor ventilation and its accompanying evils -- gas explosions, miner's asthma, and carbon monoxide poisoning from explosives and other fumes; poor ventilation is inexcusable and points to inefficiency as well as tolerance of unsafe conditions.

Anthracite mines had an average of 64 killed annually during 1925-1929 from mine cars and locomotives, as against 70 in bituminous mining in Pennsylvania and an average of 388 for the bituminous mines of the entire country. As to deaths from this cause, the anthracite mines had a materially better record than bituminous mining either in Pennsylvania or in the United States as a whole.

With an average of 42 deaths annually from explosions in anthracite mines during 1925-1929 as against 72 in bituminous Pennsylvania mines and an average of 275 in the bituminous mines of the United States, the anthracite rate from this cause is by far superior to either Pennsylvania bituminous or the bituminous mines of the United States. However, the anthracite mines have the advantage that anthracite dust enters into explosions little, if at all, so that although individual explosions or ignitions of gas are relatively numerous in anthracite mines, the number of deaths per explosion is much less than in bituminous mines, where dust ignition often takes place in explosions; this fact keeps the aggregate number of deaths from explosions in anthracite to a comparatively low figure, but it does not alter the fact that gas ignitions are far too numerous in anthracite mines, indicating that ventilation is by no means as efficient as it should be.

When the United States Bureau of Mines for the first time assembled nation-wide statistics on nonfatal accidents in coal-mining it was found for 1930 that 644,000 persons engaged in coal-mining suffered 103,821 nonfatal injuries -- approximately one injury to every six persons employed. Anthracite mines, with about 151,000 employees and 32,604 nonfatal accidents, had a much poorer record than bituminous mines, with 71,217 nonfatal accidents to its approximately 493,000 employees; moreover, Pennsylvania bituminous mines with 20,414 nonfatal accidents to its 130,000 employees had a much better showing as to nonfatals than did the anthracite mines of Pennsylvania. For 1930 the nonfatal injury rate per million hours worked was 129.1 for anthracite mines, 103.54 for all of the coal mines of the United States, and 98.15 for the bituminous mines of Pennsylvania; hence, the anthracite mines had a much poorer nonfatal rate on the basis of exposure than the coal mines of the United States as a whole or the bituminous mines of Pennsylvania. Evidently, it should not be very difficult to bring about the reduction of 1,000 accidents in 1932 in the anthracite mines as desired and advocated by the Pennsylvania Department of Mines.

While in 1931, as well as in several years preceding 1931, anthracite mining evidently had not been brought into step with the downward trend of occurrence of accidents, it now appears that the anthracite industry realizes that "it can be done," and in 1932 is proceeding to give its bituminous competitors a merry race. In January, 1932, there were but 15 fatalities in anthracite mines as against 41 in January, 1931; in February, 1932, but 19 as against 42 in February, 1931; and in March, 1932, but 24 as against 25 in 1931; hence, for the first three months of 1932 there were but 58 fatal accidents in anthracite mines as against 108 for the first three months of 1931, a reduction of over 46 per cent, while the tonnage reduction was but about 22 per cent. If the anthracite fatality rate for the first three months of 1932 continues through the year, the anthracite industry will have broken all of its records in safety, not only as to fatality rate but also as to number killed and injured; and instead of having between 400 and 500 killed in 1932, the death list will be less than 250. It also seems likely that the goal of 1,000 fewer accidents in anthracite mines in 1932 as advocated by the Pennsylvania Department of Mines will be achieved.

The age-old excuse that coal mining is inherently unsafe has been proved to be utterly unfounded, and it now appears that the dangers in coal mining are man-made to a far greater extent than they are due to nature. Coal mines have been operated for 30 or more years without a fatality, or for a year or more without a lost-time accident; coal mines or mining companies which under one management had decidedly bad accident records have been operated with utmost safety when under different management; mine officials have operated supposedly dangerous properties for years with but few if any accidents; and there are numerous instances of coal-mine workers who have been engaged in so-called dangerous types of mining activity for 30, 40, 50, 60 or more years without occurrence of an accident which caused them to lose as much as a day of work.

The very gassy mine is seldom the scene of a bad explosion disaster, and almost invariably it is the so-called non-gassy mine with its small amount of gas which takes the heavy toll of life in explosions in coal mines. In a similar way the mine with the very bad roof conditions which must be carefully handled very often has by far a better record as to fall of roof accidents than has the mine with the so-called good roof but where little attention is given to roof-supporting measures. In other words, our mining people know how to handle in a safe way the worst conditions found in mines, but fail to apply this knowledge when the conditions do not appear to be very bad. If the known precautions for safe handling of very gassy mines, of preventing explosions in very dusty mines, of preventing or at least materially reducing accidents in mines with very bad roof, of safeguarding workers in those mines in which haulage is difficult, as for instance on pitches, or of handling of explosives with relative safety -- if all of these known precautions were taken in all mines, then the accident rate in all mines could easily be brought within the figures which now give so much credit to the cement and railroad industries. This may seem to be an untenable statement, but a few of the hundreds of available facts will be given in support.

Alabama had 42 deaths from falls of roof in 1926 and 61 in 1927, and this situation was considered so bad that a campaign against falls of roof accidents was started by the State inspection force in cooperation with the Alabama Mining Institute (coal operators), the Holmes Safety Association (operators and mine workers), and the United States Bureau of Mines. As a result there were but 28 such accidents in 1928, 28 in 1929, 34 in 1930, and 8 in 1931. Similar action was taken against gas ignitions after the death of 42 persons in Alabama's coal mines from this cause in 1926, and the deaths from gas ignitions since that year have been 3 in 1927, none in 1928, 12 in 1929, 8 in 1930, and 3 in 1931. Contacts with electricity for several years were giving a much higher death rate in Alabama's coal mines (many of which are in such low coal as to make the trolley-wire hazard more difficult to avoid) than in almost any other State in the Union; after some agitation a campaign was started against this type of accident, and in 1931 Alabama coal mines had but 2 fatalities from electricity as against 11 in 1930, 11 in 1929, 13 in 1928, 9 in 1927, and 18 in 1926. In every one of these cases in Alabama, the bad record was pointed out by the State inspection force; this aroused the mining people, and all concerned openly entered into a concerted movement with the avowed intention of stopping a particular type of fatal accident and in every case succeeded. As a result of these tactics the

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coal mines of Alabama produced 470,000 tons of coal per fatality in 1931 as against but 155,000 in 1926; and while Alabama's coal tonnage had decreased 43 per cent in 1931 as compared with 1926, its fatal accidents in coal mines had decreased 81 per cent.

Coal mining, especially in its attitude toward safety, has been in a rut for many years, but there is no good reason why it can not extricate itself. However, this can be done only through intensive, continuous, intelligently applied hard work. Logically the first step is to know the facts as to occurrence of accidents, including not only fatals, but also all types of nonfatal accidents (serious, trivial, lost time, no lost time, compensable, etc.); and above all it is advisable to get the facts as to the cost of these accidents, not only in life and limb as well as in sickness and in misery, but also as to the cold-blooded dollars and cents outlay demanded through occurrence of accidents. An analysis of each accident is of utmost value, whether or not it results in a personal injury, but an analysis of all of the accidents for a year and a totalling of the dollars and cents of the accident cost as against tons of coal produced will usually speak much louder than volumes of word descriptions of the horrors or miseries entailed through accidents. There is good reason for the belief that cost of accidents in coal production is at least 10 per cent of the mine cost, and there is equally good reason to believe that at least half of this cost can be eliminated with reasonable care; and if half of the accident cost were eliminated from many mines, most of these mines would have a black rather than a red balance. The management of one moderately large producing coal mine a few years ago found that accident compensation alone cost more than $200 for every day the mine operated during the year; this figure was so appalling that stringent measures were put into effect for the prevention of accidents, and within two years the compensation cost per day the mine worked was reduced to less than $10, and the daily tonnage remained at practically the same figures as during the period of high compensation cost.

So many mining organizations, coal as well as metal, are now proving that mining can be conducted safely and efficiently at the same time, and that safe operation automatically brings increased efficiency with lowered costs, that it is absurd to try to convince well-informed people that mines are inherently unsafe or that accidents must occur wherever mining operations are under way. However, safety is not to be secured by the waving of a magic wand or by merely wishing for it; certain well-defined underlying factors must be injected into operation of mines and kept constantly in effect before safe operation can be achieved. A few of these factors are: The management including the "higher ups" must get sincerely and actively and personally behind the safety movement; means must be put into effect to bring about the active interest and cooperation of the mine officials as well as the workers in the avoidance of accidents (and very frequently this is decidedly difficult of achievement and bonuses or some similar inducement must be given either to workers or to officials or to both); every mine should have an actively functioning safety organization with monthly safety meetings at least and preferably with participation by workers; all persons in every mining organization should be well trained in first aid; every mine should have a set of safety rules, preferably in a printed pamphlet, so it may be at all times available to every employee, and these rules should outline in simple language the minimum safety requirements of the management and of the State law, these rules to be revised from time to time to keep pace with changing conditions and to correct weak points; above all things every mine official should use the utmost care to follow out the safety rules at all times, as it is difficult to find anything more demoralizing in trying to bring about real safety than to have workers see safety rules violated or disregarded by officials; as previously indicated every accident whether or not an injury results, should be studied to ascertain the cause and the probable method of prevention of recurrence; and at intervals data on accidents should be compiled and carefully studied in an effort to eliminate the causes of those of most frequent occurrence or of greatest seriousness in injury or in cost. One of the most fruitful aids in bringing about increased safety in mining is to keep in touch with safety performances of other mines, particularly mines in other regions, with the idea that whatever one operator can accomplish can be done by any other wide-awake operator. And in this it may be well to call attention to the fact that many mines, including a number of coal mines, are now trying to avoid not only fatalities, and permanent disability accidents and serious accidents, but also any kind of lost-time accidents; and numbers of both coal and metal mines have operated a year or more with production of hundreds of thousands of tons of coal or ore without occurrence of any accident which would prevent the victim from returning to his usual work on the following day.

The mine inspectors of the various States can do a valiant service to safety in mining by prompt issuance in mimeographed or similar form of fairly full details concerning not only fatal but also certain nonfatal accidents which are abnormal or the occurrence of which conveys a lesson of value to others. Some of the State inspection forces are now doing excellent work in this respect, and it is to be hoped that others will adopt the practice, possibly with variations or extensions.

To achieve maximum results in the safe operation of mines, there must be the closest cooperation by all of those engaged in the mining industry, including the mine operator and his officials, the mine workers, the State inspection force, and the forces of the United States Bureau of Mines, or others known to be striving to bring about safe operation of mining properties. Without such wholehearted cooperation, real safety in mining will be difficult to attain. It would also appear that one of the main functions of the State inspection forces in addition to that of trying to enforce the existing safety laws should be the dissemination of up-to-date data on safety in mining, even when that information is in addition to or beyond the bare requirements of State law or State regulations.

While there is ample room for rejoicing over the downward trends of accident rates, coal mining can by no means consider that its present accident-prevention activities meet all its needs, and this refers to bituminous as well as to anthracite mining. No thinking coal-mining man can afford to be complacent when confronted with figures showing that both as to accident frequency and accident severity the coal-mining industry has by far the worst record of all the major industrial activities in the United States. And the bituminous coal mines can not throw the burden of this bad record wholly upon the shoulders of the anthracite industry, for the bituminous rates also are much worse than those of other major industrial pursuits. Moreover, our national pride should not be forced longer to be confronted with statistics showing that even with the improved rates established in 1931 our coal-mine workers have an occupation two, three, or four times as hazardous as have the coal-mine workers of other countries which produce coal in quantity.

1932 SAFETY RECORD

1931 was a record year in coal-mine safety, but if the first three months of 1932 are any criterion, it is likely that 1932 will have even a better safety record. The Bureau of Mines figures for coal-mine fatalities for the months of January, February, and March, 1932, show but 326 fatalities--a much more favorable record than the 411 for those months in 1931. Both anthracite and bituminous mining operations are participating in the good work; anthracite mines have had but 60 fatalities in 1932 up to May 1, as against 108 for the same period last year, and bituminous mines have had 266 as against 303.

States which have materially bettered their safety record for the first three months of 1932 as against the same months of 1931 are Indiana, Ohio, Pennsylvania (both anthracite and bituminous), West Virginia, and Wyoming. States which have maintained or slightly improved a good record set in 1931 are Alabama, Alaska, Colorado, Illinois, Kentucky, Missouri, Montana, Tennessee, Texas, Utah, and Washington.

Virginia has a decidedly poor record for the first three months of 1932 with 54 fatalities against but 5 for the similar period of 1931. Other States which have a poorer record so far in 1932 than for the similar period of 1931 are Arkansas, Iowa, Kansas, Maryland, Michigan, New Mexico, North Dakota, and Oklahoma. Alaska, Montana, and Texas have had no fatalities so far in 1932.

If major disasters can be avoided, and they can be if anything like reasonable care is taken, 1932 should have a better coal-mine safety record than any year in the modern history of coal mining in the United States.